
Space Weather Forecast

Issued on Tuesday, 26 September 2023 at 13:04 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of M-flares (R1-R2 Radio blackouts) throughout. Slight chance of G1-G2 Minor/Moderate geomagnetic storms Day 1 (26 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, with the largest flare a mid-level Common-class flare observed at 26/0428UTC from the main sunspot region in the south-centre disc.

There are currently eight numbered and one un-numbered sunspot regions on the visible disc, with six of these located in the western hemisphere. The region located in the south-centre disc is a mixed polarity region and remains the largest, most active. Only small changes in evolution have been observed in recent imagery. Two moderately large bipolar regions are in the northwest quadrant, again with slow overall changes in evolution. One of these is now beginning to rotate around the northwest horizon. Another moderate size region is now nearing south-centre disc, and has continued to show some growth and consolidation. Other region are generally simple and unremarkable.

A filament lift-off around 25/1540 UTC produced a CME to the northwest which is being assessed for any potential Earth directed component. Otherwise, no other potential Earth-directed CMEs have been observed in the past 24hrs.

Solar Wind / Geomagnetic Activity: Solar winds have been at largely slightly elevated levels, due to the lingering effects of a CME which arrived at Earth on the UTC evening of the 24 September. The Interplanetary magnetic field strength (IMF), Bt, started the period at strong levels before reducing to moderate levels. The north-south component (Bz) was often at moderate levels, but switched from predominantly northward pointing to predominantly southward pointing after midnight UTC. Resultant geomagnetic activity was in the range Quiet to Active (Kp 2 to 4), but with a G1/Minor Storm (Kp 5) interval observed between 26/0600-0900UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be generally Low, but with a chance of M-class flares, and a slight chance of isolated X-class flares, most likely from the main sunspot region in the south.

Solar Wind / Geomagnetic Activity: Further CME arrivals are possible into Day 1 (26 Sep). Confidence is low however, with glancing impacts most likely. Solar winds are likely to remain at slightly elevated levels on day 1 (26 Sep) gradually trending toward slow-ambient levels in the absence of any further CME arrivals. Geomagnetic activity will be mostly Quiet to Active (Kp 2-4).
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4), with a chance of G1/Minor Storm (Kp 5) intervals on Day 1 (26 Sep) due to ongoing waning CME effects, and also possible further glancing CME effects. Quiet to Unsettled (Kp 1-3) activity is then expected to dominate from Day 2 (27 Sep). However, a further enhancement is possible late on Day 3 (28 Sep) with another potential glancing CME, but this is very low confidence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain generally at background levels, but with a slight chance of Solar Radiation storms.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	Yes	30	20	10	20
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)